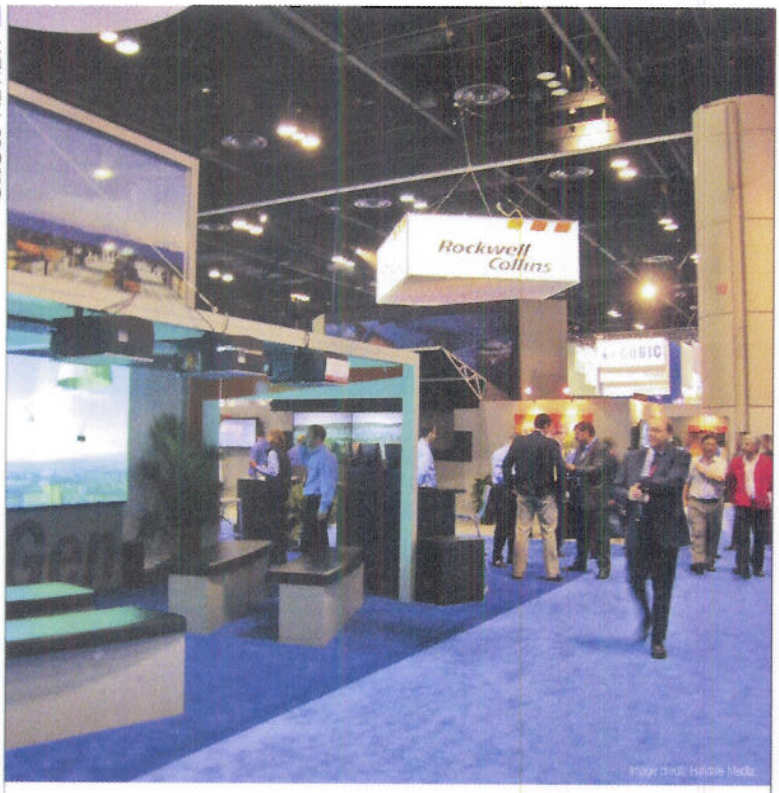

I/ITSEC Orlando 2006

MS&T editorial staff serves up a sampler of the wares at the industry's premier training, simulation and education event at Orlando's Orange County Convention Center.

Immersive Battle Stations 21

Sights and sounds are usual at I/ITSEC. This year it was also the shudder, shake and vibration of the passageway floor, the pungent smell of fire and the feel of its heat, the breath of suffocating hot steam in one's face and the somewhat panicky disorientation in the dark, all experienced during a simulated missile strike in the Battle Stations 21 demonstrator.

The demonstrator provided a sampling of what Navy recruits will experience aboard the simulated Arleigh Burke-class guided-missile destroyer USS Trayer at the Recruit Training Command at Naval Stations Great Lakes, Illinois, before graduation as Navy sailors. During a 12 hour "passage" the 352 embarked recruits will be exposed to a total of 17 different scenarios, varying from normal operating conditions to battle damage and flooding compartments.

A team of personnel from the Great Lakes Station, the Naval Training Service Command, NAVAIR Orlando Training Systems Division and McHugh Training and Simulation joined up to develop the $82.5 million simulator which is largely based on entertainment technologies. The first full class of 352 Navy recruits to conduct their final training exercise aboard the Trayer are expected to do so in June 2007. www.nstc.navy.mil/battle_stations_21_New.htm

High Definition Visuals

No visual display so far equals resolution of the 20/20 Immersive Visual Display for Distributed Mission Operation Advanced Technology Demonstration (ATD) presented this year by the Air Force Research Laboratory (AFRL) Warfighter Readiness Research Division. The two ATD four-by-four-foot, side-by-side full-color displays feature a resolution of 5120 x 4096 pixels at 60 Hertz and meet or exceed 20/20 vision levels. This ultra-high resolution is provided by four Evans & Sutherland laser projectors, commercial off-the-shelf PC image generators and L-3 Communications image generator software. This resolution is sufficient for target identification at true combat ranges.

Medical Simulation

More military organizations and companies displayed medical simulation devices and software than in previous years, and Medical Simulation, for the first time, was the focus of an I/ITSEC Special Event.

Topics ranged from virtual reality as a treatment for post-traumatic stress disorder (PTSD) to the Defense Advanced Research Projects Agency (DARPA)'s Virtual Soldier. Richard Satava of the University of Washington's Department of Surgery explained how the Virtual Soldier project could revolutionize medical care for soldiers injured in the battlefield. Harvey McGee of the US Army's Telemedicine and Advanced Technologies Research Center (TATRC) outlined the Combat Medic Training System (COMETS) and the Advanced Initiative for Medical Simulation (AIMS).

On the show floor, the US Army's Research, Development and Engineering Command (RDECOM) demonstrated the advanced wireless Stand Alone Patient Simulator (SAPS) developed in cooperation with Medical Education Technology, Inc., (METI) and the Army's Program Executive Office for Simulation, Training and Instrumentation (PEO STRI) that will be used at the Army's Medical Simulation Training Centers. The Centers were represented at I/ITSEC as one part of the many PEO STRI exhibits at the show. Forterra Systems Inc. demonstrated how its OLIVE gaming environment is being used by TATRC and RDECOM to develop PC-based medical training programs. Gaming developer BreakAway Ltd., showcased the Pulse!! Virtual Clinical Learning Lab the company developed with Texas A&M University-Corpus Christi.

Joint Military Development Services JMDS demonstrated artefacts, like skulls, used in training war crimes investigators, and wound kits to support disaster response team training.

More robotic vehicles

Robotic vehicles and the means to train their operators rose to new prominence – they were everywhere.

Several robots on display were models used in Iraq and Afghanistan to conduct hazardous operations. PEO STRI has been supporting robot operator training for these unmanned vehicles, and has teamed with the Army's Robotics System Joint Program Office.

Another first time special event was the "Human Performance in an Unmanned World" session that addressed the Department of Defense efforts to reduce battlefield casualties on the battlefield through the increased use of unmanned vehicles.

Some companies and exhibits that caught our eyes

3Dsolve demonstrated DPM-3D, a three-dimensional dynamic plant model, which creates a high fidelity multi-user training environment that communicates with real or simulated equipment. The actual project supports up to 5 trainees and an instructor, walking through the 3D scene as visible or invisible avatars while communicating with each other, and concurrently interacting with the 3-Dimensional virtual equipment. The technology is expandable to support hundreds of simultaneous participants – leading to Massive Multiplayer Online Training (MMOT).

BAE Systems / C-ITS AB presented CEBRA, an authoring tool that makes creation and maintenance of XML based, SCORM compliant Advanced Distributed Learning (ADL) really easy. CEBRA allows non-technical subject experts to work in a desktop environment, where no programming skills are required. ADL created in CEBRA can be read by or moved between any systems; and it can be distributed in any format such as Web, PDA or print.

Barco announced the release of its new SIM 7 switching Liquid Crystal on Silicon (LCoS) projectors capable of providing high-speed motion applications for flight training and mission rehearsal at the show. The company also demonstrated its new Instructor Operator Station, which features its new XDS-1000 external desktop system.

Breakaway Ltd., a Maryland company with a gaming background, was touting its mosbe desktop development studio. At IITSEC, CEO and founder Doug Whatley announced a DoD small business program to create a video game-based maintenance training tool for US Marine Corps personnel. Partner RTI International will apply advanced sensors for detecting the "trainee cognitive state" so the system can adapt to individual users. A previous Breakaway game, 24 Blue, trains Navy aircraft carrier flight deck personnel on safety and interoperability procedures.

Visual display specialist Christie unveiled the first 3-chip DLP projection system on a domed, full-motion platform – for the Rockwell Collins Canadian Maritime Helicopter Program (a CH-148 aircraft) – with 8 Matrix 4000 projectors for the panoramic view and a pair of Matrix S+2K models for the chin window displays. To handle the 3G forces, Christie designed special adjustable mounts, braces, and clamps. As part of its "TotalVIEW" solutions package, Christie was also emphasizing its "smart button" type Automatic Display System and Calibration and Motorized Optical Blending for consistent image quality and reduced maintenance on projected arrays, as well as ChristieTWIST for edge-blending and image warping.

The 2006 event housed over 500 exhibiting companies.

Image credit: Hallside Media

ELBIT featured BEST (Battlefield Enhanced Smart Training), a joint simulation infrastructure, which has already been selected by the Israel Defence Forces. BEST is based on a common core COTS technology; it links operational C4I and simulation while supporting interoperability, distributed joint training and debriefing.

One year downstream from its acquisition of AI.implant, Engenuity was showing off integration with SAIC's OneSAF for urban simulations, with Lockheed Martin's Virtual Combat Convoy Trainer (VCCT), and a suite of simulation development tools branded as AIMS (Adaptable Intelligent Modeling and Simulation). AIMS leverages Engenuity's flagship STAGE package and AI.implant computer-generated entities, as well as partner offerings such as Diamond Visionics' Genesis RT on-the-fly visual database and DI-Guy human models from Boston Dynamics.

ETC Simulation presented the Advanced Disaster Management Simulator (ADMS™), an interactive system that provides first responders an opportunity to develop skills in command, control, mitigation and emergency communication under extremely stressful yet safe conditions. ADMS can be used to simulate virtually any emergency, including aircraft accidents, terrorist acts, hazardous material spills, airfield incursions, fires and natural disasters. Incidents are not pre-scripted and play out in real time as fires, injuries, spills and other elements progress according to dynamic and sophisticated algorithms based on real-world physics.

Intersense was demonstrating some intriguing motion tracking technology. Their IS-900 "MiniTrax" inertial/ultrasonic system is being used for head/helmet tracking on the US Army's AVCATT (Aviation Combined Arms Tactical Trainer) and the US Navy's F/A-18C distributed mission training devices, both of which incorporate L-3/Link displays. Their hybrid InertiaCube sensor tracks motion without any external reference source, applying predictive algorithms to produce a best estimate of the object's motion.

Israel Aircraft Industries (IAI) exhibited its new Distribution Mission Training (DMT) system for the first time at I/ITSEC 2006. The system consists of a network-linked F-16 cockpit with a high-resolution visual dome and a control/instructor station for planning and debriefing, which can be tailored to provide training for six aircraft. Also at the company's exhibit was the Mission Planning and Control station for the planning of complex training scenarios.

LaserShot, in addition to their stable of training devices – such as live fire trainer, military skills trainer and course of fire trainer – and a range of technologies – video digital and live simulation – demonstrated an elegant solution integrating a motion platform, a boat hull, instrumented weapon and a COTS gaming engine. A crowd pleaser.

MetaVR showed off its new GIS 3D Layering Control Plugin for its ESRI ArcMap. That product is an interface for the company's 3D real-time VRSG terrain databases that enables users to dynamically visualize in layers the various linear and point features that make up a virtual world. The company also demonstrated new support for water simulation, which features wave animation and sky model reflection on the surface and realistic underwater visibility.

NGRAIN announced plans to jointly develop with Standard Aero a 3D-enabled Interactive Electronic Technical Manual (IETM) for the T56 engine used on Lockheed Martin C-130 Hercules and P-3 Orion aircraft. The IETM will feature fully interactive 3-D simulations. The company also announced a partnership with CaseBank Technologies, Inc., to develop a 3D-enabled Troubleshooting Performance Support solution

Rheinmetall Defence Electronics introduced their new Night Training System AVIOR® NTS. The complete vision system consists of a PC-based image generator, the AVIOR® laser

family components, and the newly developed AVIOR® VisIR. The new technology provides an almost perfect visualisation of typical night-vision effects, like blooming and halo. Pilots can train with a large number of effects using their own original night vision goggles.

Having acquired such specialty companies as NLX, Evans & Sutherland, and Kaiser, Rockwell Collins is aiming to be a major one-stop shop in the simulation training arena. They announced contract awards of the F-35 Joint Strike Fighter pilot training device image generators and Mission Command Trainer upgrade for the UK's Army aviation. Among the more intriguing technologies on the stand was a ProView lightweight helmet-mounted display with full SVGA resolution.

RUAG showcased COSIM PE, a man worn Tactical Simulation System, featuring a narrow beam coded laser, which provides high accuracy, specially required for security forces, special police units or comprehensive training for Operations Other Than War. Also shown was fully deployable, appended equipment for gunnery training.

SAAB Training System displayed instrumented solutions for urban operation, convoy and IED training. SAAB's Collaborative Training Environment 'WISE', which allows live, virtual and constructive elements to be integrated concurrently into one platform, took part in the Joint Virtual Training Special Event (JVTSE).

SEOS demonstrated its new 2015HC ultra-high resolution QXGA projector for the first time at I/ITSEC 2006. The company also announced its partnership with VRSonic to incorporate that company's 3D Spatial Audio System into the University of Plymouth's William Day Planetarium, which features SEOS projectors. The joint effort will produce the world's first fully digital and immersive video and audio experience

SGI, which now focuses on processing massive amounts of data, was touting its "Exercise in a Box" solution for simulated military training exercises. The self-contained, small footprint, portable platform (about the size of an airline beverage cart) is designed for field deployment yet contains the power of 28 PCs and can support 5000-6000 simulated entities. It can come pre-loaded with OneSAF software.

THALES presented 3Dchrono, a powerful VR mission rehearsal tool that optimises the process of three-dimensional modelling in urban areas. The kit was originally designated to support interventions of the French special operation forces. It allows replicating – within hours instead of days – detailed infrastructures with or without their immediate neighbourhood, including ground relief and meteorological conditions. The system accepts data from all available sources, satellite imaginary, photos and maps, CAD, or even the charlady. The equipment meets operational needs of organisations involved in rescue operations, security, or intervention in high-risk areas or evacuation.

TNO showcased the EAGR training concept, a pioneering Job Oriented Training (JOT) philosophy, which puts the students, their responsibility and performance on the job in the centre. It supports 'natural learning' by making use of the self-learning ability of people. EAGR is largely using simulation, VR and gaming elements. TNO has reworked the curricula for the training of petty officers at the Netherlands/Belgian Operational School to fit the JOT philosophy. According to head of the school, Commander Jereon Stricker, the results are encouraging. The Royal Netherlands Army is also working to turn their infantry school classes into JOT.

US Joint Forces Command (USJFCOM) staged the Joint Virtual Training Special Event (JVTSE), to showcase training tools used by the US Forces and those of Sweden and Australia. The scenario, based on a homeland defence incident, was a live, virtual and constructive mix distributed to eight different booths in the exhibition hall. A highlight was the active participation of a Swedish counter-terrorism unit that rescued hostages in the dining hall area. This live action was synchronized with the JVTSE. Also for the first time, Sweden had integrated its Persistent Partnership for Peace Computer Federation with the USFFCOM Joint Conflict and Tactical Simulation Model. MST